In item 3 on page 3 of the above-identified Office action, the drawings have been objected to. This application was filed with informal drawings, formal drawings will be filed at a later stage of the application procedure.

In item 6 on page 3 of the Office action, claims 1 and 7-9 have been rejected as being anticipated by *Summerfelt et al.* (US 5,566,045) under 35 U.S.C. § 102.

In paragraph 2 on page 4 of the Office action, claims 1, 3-5 [3, 5] and 7-12 have been rejected as being anticipated by *Kawakubo et al.* (US 5,691,219) under 35 U.S.C. § 102.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and the claims have, therefore, not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> a barrier layer disposed below said capacitor dielectric, said barrier layer consisting essentially of a compound

formed from a ***transition*** element and a material selected from the group consisting of phosphorus, sulfur, and arsenic.

Summerfelt et al. disclose electrodes wherein a thin unreactive film is contacting a high-dielectric constant material. The thin unreactive film provides a stable conductive interface between the high-dielectric constant material and the electrode base.

On page 4, lines 2-3, of the Office action, the Examiner stated that *Summerfelt et al.* contain a barrier layer "which is a compound of a transition element (**In** or **Ga**)" (emphasis added). According to THE COMPACT OXFORD ENGLISH DICTIONARY, 2nd edition (1991), page 407 (a copy of which is enclosed), transitional elements are "elements occurring ***between*** the even and odd series of a long period" (emphasis added). However, In and Ga are part of group 3**A** of the period table and, therefore, are not between the even and odd series of a long period and, hence, are not transitional elements.

Kawakubo et al. disclose a semiconductor memory device. According to *Kawakubo et al.*, col. 7, lines 56-58, "the barrier metal film 12 can be made of titanium, tantalum, tantalum nitide or the like, instead of titanium nitride". In contrast, the invention of the instant application as recited

in claim 1 has a barrier layer consisting essentially of a compound formed from a transition element and a material selected from the group consisting of ***phosphorus, sulfur,*** and ***arsenic***. Nitride is not recited in claim 1. Also Titanium is in group 3**A** of the period table and is, therefore, not a transitional element.

On page 4, last paragraph, through page 5, first paragraph, of the Office action the Examiner states "Kawakubo et al. does not explicitly teach that the barrier is a compound of a transitional element and phosphorous. It is inherent that the transitional metal layer (12) will react with phosphorous from the connection structure to form a barrier material such as a TiP or TiP [sic]. Therefore, it is inherent that Kawakubo et al.'s device including a barrier of TaP or TiP. See reference US 6015997 col. 7 lines 55-60 which was cited to support the inherence". US 6,015,997, states at col. 7, lines 55-60, that "[c]ertain Group VB nonmetal elements, such as: N, P, As, and Sb, can react ***with titanium*** to form barrier materials" (emphasis added). However, titanium is not a transitional element, and therefore, it is ***not*** inherent from US 6,015,997 that Kawakubo et al.'s device includes a transition metal phosphide.

Clearly, neither *Summerfelt et al.* nor *Kawakubo et al.* show a barrier layer formed from a ***transition*** element and a material

selected from the group consisting of phosphorus, sulfur, and arsenic as recited in claim 1 of the instant application.

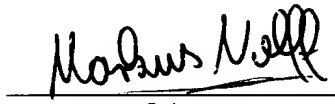
Furthermore, it is also believed that such a barrier layer as recited in claim 1 is non-obvious over the cited references since none of the cited references gives any suggestion to form or use such a barrier layer as recited in claim 1.

It is accordingly believed to be clear that neither *Summerfelt et al.* nor *Kawakubo et al.* show the features of claim 1. Also it is believed that neither *Summerfelt et al.* nor *Kawakubo et al.* suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since claims 1, 3, 5 and 7-12 are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1, 3, 5 and 7-12 are solicited.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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